

Woodward-Clyde Consultants



Engineering & sciences applied to the earth & its environment

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May 30, 1996
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Ms. Lisa Marino, RPM
Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

Re: Response to U.S. Environmental Protection Agency (EPA) Letter of May 6, 1996
Phase II Remedial Investigation (RI) Modifications
Former Koppers Company, Inc. Site
Newport, Delaware

Dear Lisa:

Woodward-Clyde Consultants (WCC) has prepared this letter to respond to issues presented in EPA's letter, dated May 6, 1996. The May 6 letter presented EPA comments related to modifications or supplements to the field investigation at the Former Koppers Company, Inc. Newport Site presented in WCC's letter of April 24, 1996. The contents of EPA's May 6 letter are presented in this letter as bold type.

1. Woodward-Clyde Consultants (WCC) has proposed to modify the Marsh/Drainageway NAPL delineation task such that sampling would be conducted down to the top of the newly discovered clay layer versus down to the top of the Columbia Formation. WCC has also proposed to sample to the top of the Columbia Formation in three locations. EPA's concerns are as follows:
 - A. EPA does not concur that 3 locations are adequate to characterize the thickness of the clay layer across the "entire wetland area." EPA proposes that 26 locations are needed to adequately characterize the clay layer in these large areas (10 in the Hershey Run Drainage Area, 6 in the West Central Drainage Area, and 10 in the East Central Drainage Area.

Response: WCC is confident that the clay layer exists across the wetland area at a thickness of 3 or more feet based on the following:

- The clay was encountered at all of the grid sample locations for the surficial NAPL/PAH delineation program in the Hershey Run, West Central, and East Central Marshes, and the Hershey Run channel down to at least White Clay Creek.
- The three locations selected for sampling through the clay identified the clay at minimum thicknesses (the base of the clay unit was not reached) between 2.8 and 4.5 feet, suggesting that the clay unit is consistently 3 or more feet thick. These locations were expressly placed widely across the Site to evaluate thickness and presence of the clay in the wetlands at the Site. The consistent results regarding thickness between these three widespread sampling points is a good indication that the clay is several feet thick in each of the drainageways at the Site.
- The clay was consistently identified at a thickness of several feet in the wetland areas of the DuPont-Newport Superfund Site, adjacent to this Site.
- The clay was encountered in Churchmans Marsh during the Remedial Investigations of this Site and the DuPont-Newport Superfund Site.
- We also believe that the clay was encountered during the installation of I-95. (This could be confirmed through evaluation of test borings for the highway, if necessary.)

All of these factors taken together suggest that the clay is present at 3 or more feet in thickness across the wetlands at the Site. However, based on preliminary review of the Phase II RI data, the gray clay has not been encountered at any of the boring locations in the upland area of the Site; therefore, additional data regarding clay thickness should be focused on areas of the wetlands close to the wetland boundary and towards the Site boundaries. We propose that hand borings be advanced into the clay along each of three transects aligned between the three clay borings that have already been performed and the wetland boundary.

However, data collected from each of the grid points sampled during the Phase II RI should be used in evaluating clay thickness and considering additional data needs; several hand auger borings advanced at these points during the NAPL/PAH delineation program were advanced up to a foot into

the clay. Therefore, we propose that any additional work regarding clay thickness be conducted during the Phase III RI program to allow consideration of data collected during the Phase II RI.

- B. Is WCC certain of, and is there documentation of field observations which support, the contention that the "up to 3 feet of sediments which overlie the clay layer" in places are not sediments of the Columbia Formation? If the NAPL containing sediments are laterally in hydrologic connection with the Columbia Formation deposits, that represents a potential migration pathway. Does the "clay layer" demarcate the upper limit of the Columbia Formation or is the clay a facies within the Columbia Formation which may be discontinuous (i.e. vary with depositional subenvironment)?**

Response:

Our interpretation of the stratigraphic data collected thus far at the Site is that the "up to 3 feet of sediments which overlie the clay layer" represent organic sediments typical of wetland environments. These sediments are younger than (Recent in Age) the Columbia Formation, which is Pleistocene in Age. The Columbia Formation across most of the Site has a base elevation of approximately -5 to -10 feet (NGVD), well below the wetland surficial elevation of approximately 2 feet, and is therefore projected to exist beneath the wetland silts and clays. This is consistent with observations at the DuPont-Newport Site, where coarse sands of the Columbia Formation have been observed below organic silts and clays in areas where wetland environments have historically been present. This is also consistent with the fact that the Columbia Formation is present below the clay unit in the Churchmans Marsh area (this is based on reports that the Department of Transportation used some of the sands and gravels of the Columbia Formation in the Churchmans Marsh area for the construction of I-95, and on the observation of the clay unit in Churchmans Marsh during sampling activities related to RIs at the Site and the DuPont-Newport Superfund Site).

Our interpretation is that the gray clay unit underlying the wetland sediments is not part of the Columbia Formation, and overlies the Columbia Formation in the wetland areas of the Site. Where the Columbia Formation is not present, such as the northwest corner of the Site, the clay unit may overlie the Potomac Formation.

The Columbia Formation in the northwest area of the Site is interpreted to pinch out as the top elevation of the Potomac Formation (which underlies the Columbia Formation) rises to an elevation of approximately 1 foot or more. In that area of the Site, the Potomac Formation may directly underlie the gray clay identified in the wetland areas.

- C. The depositional environment represented by the Columbia Formation is fluvial; lithologic and/or textural heterogeneity is the rule rather than the exception. Therefore, WCC should demonstrate the continuity of the clay layer, if the objective is to assert that it acts as a barrier.**

Response: As discussed above, the distribution the three boring locations advanced into the clay unit and the consistent results regarding thickness at each of those locations suggests the uniform presence of the clay unit. As discussed in the response to Comment 1A, additional evaluation of the unit should focus on its relationship with the upland area. In addition, two vertical permeability tests will be performed as specified in our April 24, 1996 letter to evaluate the potential of the clay as a barrier to the downward migration of DNAPL.

- D. Sufficient data is needed through the entire section in order to feel certain of the stratigraphy. WCC should compile and examine the site profiles done near the wetland areas for DNAPL delineation and the Phase I soil borings to see how the clay layer may or may not be represented.**

Response: Data collected from borings advanced adjacent to wetlands during the Phase I RI were evaluated. The clay unit does not appear to be present at any of those locations. Data collected in relation to the Phase II RI DNAPL delineation program also did not identify the clay.

- E. If data suggest that the clay layer is permeable, then EPA reserves the right to investigate to the top of the Columbia Formation.**

Response: As discussed in the response to Comment 1C, two vertical permeability tests will be performed as specified in our April 24, 1996 letter. If the results of these tests provide permeability data that are unacceptable with respect to potential downward migration of DNAPL, then additional data collection may be necessary. Additional data collection below the clay layer in areas where

DNAPL exists above the clay will not be considered due to the potential for creating routes for the downward migration of the DNAPL.

2. **Bullet #1: The investigation of the vertical extent of NAPL within the Hershey run Drainageway is already shortened by stopping at a shallower depth than is detailed in the work plan. What is the justification for increasing the spacing (from 200 feet to 400 feet) as well?**

Response: As a first step in the delineation process, a reconnaissance of Hershey Run was conducted at the 200-foot intervals specified in the Phase II RI Scope of Work (dated December 21, 1995) to determine the presence or absence of DNAPL. The results of the preliminary reconnaissance indicated that the DNAPL boundary in the channel where sediment is present extended down to the area of Phase I sediment sampling station HRM7 (toward the lower end of Hershey Run). Sediment coring was also performed in the marsh area adjacent to each of the stations evaluated in the channel. Knowing the surficial extent of DNAPL in the Hershey Run channel and adjacent marsh areas, it was determined that using an interval of 200 feet would have provided redundant data, and that a 400 foot interval was sufficient to provide a delineation of the vertical extent of DNAPL within the channel. Three cores were collected through the sediments to the top of the clay unit at each of the 400-foot intervals in the Hershey Run channel to provide a profile of the NAPL and the channel.

3. **Upland NAPL Delineation: WCC has proposed to modify the analytical delineation of the PAHs around each of the surficial boundaries. The actual area boundaries are proposed as a reference rather than the approved grid system to avoid placing samples at "arbitrary distances." EPA has two questions/concerns. First, why is WCC proposing to use 100 to 300 foot intervals rather than the approved 100 foot spacing? Second, it seems more arbitrary to use the proposed method rather than using the grid system method. Please provide some justification.**

Response: The use of the surficial weathered NAPL boundaries for the placement of sampling stations for PAH delineation is not arbitrary, as it places the station location at specified distances from a known boundary. The use of a grid system to locate sampling stations for PAH delineation would place the stations at arbitrary distances from the weathered NAPL boundary. The

sampling interval was increased due to the size of the surficial weathered NAPL areas identified in the first step of the program; some of these areas are 1000 or more feet long. Sample stations for the collection of PAH data were spatially placed around each of the surficial weathered NAPL areas based on the area size and shape; 100 to 200 foot intervals were used for the smaller areas and 200 to 300 foot intervals were used for the larger areas. This resulted in 143 stage 1 sample stations; the number of stations actually sampled was greater than that due to the detection of total PAHs at concentrations greater than 100 ppm at many of the stage 1 locations. This approach is consistent with the approach that I presented to you during our April 16, 1996 telephone conversation.

In addition, vertical delineation of the PAHs in each of these areas has been performed on the areas based on the surficial 100 ppm PAH boundary defined by immunoassay field analysis. Four borings were performed in each of these areas with all samples collected from them analyzed for PAHs using the immunoassay field kits; one sample from each of the areas was submitted to the laboratory for confirmation analysis, as discussed with you during our telephone call of April 30, 1996.

4. **Pond sampling:** Cores for physio-chemical characterization were originally proposed within this task. How will the pond NAPL be characterized?

Response: Samples for physio-chemical characterization were proposed for weathered NAPL in the uplands area of the Site and for sediments containing NAPL in the wetland areas of the Site. These parameters were not identified for analysis of NAPL in the ponds.

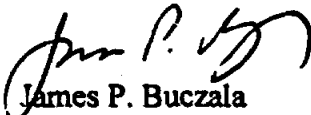
As you know, the Phase II RI field program has been a dynamic and developing program. As data were collected during the program and our understanding of the Site was adjusted, the program in turn required some modifications (as discussed above and in the April 24 letter). We greatly appreciate the EPA's flexibility and responsiveness in discussing these issues with us to reach decisions that allowed the field program to proceed unabated in an appropriate manner. Due in part to the open communication we have been able to maintain with EPA throughout the program, the Phase II RI remains on-schedule, even though the actual work scope has increased.

Ms. Lisa Marino, RPM
U.S. Environmental Protection Agency
May 30, 1996
Page 7

**Woodward-Clyde
Consultants**

We have completed the portion of the field program associated with Item Nos. 1, 2, and 3 of this letter in a manner consistent with the procedures presented in WCC's April 24, 1996 letter, with those presented above, and with those communicated to you during our telephone conversations on April 3, 11, 16, and 30, 1996. If you would like further clarification of the issues presented in this letter, please do not hesitate to call.

Sincerely,


James P. Buczala
Project Manager

cc: Margie Zhang, DNREC
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